Local Optionality

Jason Riggle and Colin Wilson

University of Chicago and UCLA

1. Introduction

A phonological or morphophonological process is optional if it need not apply to every instance of its structural description. For example, French has an optional process that deletes schwa in the context V(#)C___ (Dell 1970). Application of this process to an input such as /ãvi#də#tə#batʁ/ *(tu as) envie de te battre* '(you) feel like fighting' results in three outputs: *ãvidtəbatʁ* (deletion of the first schwa), *ãvidətbatʁ* (deletion of the second schwa), and *ãvidətəbatʁ* (no deletion). Cases such as this one are important for phonological theory because they reveal that process application is to a certain extent *position-specific*. Within a single input/output mapping, instances of the structural description of a process at different locations can undergo, or fail to undergo, the process in partial independence from one another.

In rule-based phonology, position specificity has been incorporated into the definition of how rules apply to forms (Anderson 1974: 221ff.; see also Howard 1973:154ff., 245ff.). The relevant portion of Anderson's algorithm, which remains one of the most explicit proposal on this point, is repeated in (1).

(1) To apply a rule to a string (quoted from Anderson 1974: 227-8)
   a. Identify all of the segments which satisfy the conditions for the application of the rule, and circle them. For each such segment, identify the minimal substring of the form which provides the environment allowing the segment to undergo the rule.
   b. If the rule is optional, eliminate from consideration any or all of the segments which could undergo the rule, together with their associated environments.

This paper addresses the problem of accounting for position-specific application of optional processes within Optimality Theory (Prince and Smolensky 1993/2004). We argue that the current dominant approach to optionality in OT, which claims that multiple outputs arise from reranking of standard OT constraints (Anttila 1997, 2002, Boersma 1998, Boersma & Hayes 2001, Nagy & Reynolds 1995; see also Ash 2001, Legendre et al. 2002), is not descriptively adequate.[1] We also argue against an approach, analogous to (1), that would allow violations of specially marked constraints to be optionally eliminated. The central idea of our proposal, outlined in (2), is that, for the purposes of evaluation and harmonic ordering, standard constraints are replaced with position-specific versions. It is these position-specific constraints that interact with one another to determine the optimal output, and that give phonological optionality its local character.

(2) Position-specific evaluation in OT

a. In evaluating the outputs for an input *I*, every constraint C is replaced by a set of position-specific versions (C@1, …, C@*n*), one for each position in *I*.

b. A variable ranking between C and D, written '{C≈D}', implies free reranking of their position-specific versions: every total ranking of {C@1, …, C@*n*, D@1, …, D@*n*} is consistent with {C≈D}. Thus it is possible for C to dominate D at certain positions, while D dominates C at others.

The paper is organized as follows. In section 2, we give data from Pima, French, and Miya to illustrate a kind of optionality, referred to as *local optionality*, that is crucial to our argument. We concentrate in particular on reduplication in Pima, where the data is drawn from fieldwork by one of us (Riggle), and give arguments against approaches to optionality that do not make use of position-specific constraints. In section 3, we formalize our proposal, focusing on defining the core notion of *position* that ensures consistent evaluation across candidates for the same output, and demonstrate how it accounts for the cases reviewed in section 2. In section 4, we conclude the paper with a summary of our results and a discussion of how cases in which optionality is global, rather than local, can be accommodated within our theory of evaluation.

2. Local optionality

Local optionality is defined negatively, as the state of affairs in which some of the observed outputs of an optional process cannot be derived by reranking (plausible) constraints that are not position-specific.[2] The empirical burden of this paper is to demonstrate that such cases exist. In carrying this out, we apply the concept of *collective harmonic bounding* (Samek-Lodovici & Prince 1999, 2002) to the analysis of candidate competition under constraint 'ties'. A candidate ω is harmonically bounded, given a hierarchy that contains one or more variable rankings, if ω loses to some alternative candidate under every possible resolution of the tie(s) into a total ranking. Collective harmonic bounding holds when ω is harmonically bounded, but there is no single candidate that bests it under every such total ranking.

[1] This problem was first pointed out by Vaux (2003).

[2] The analogous definition for rule-based phonology has traditionally referred to the inadequacy of 'simultaneous' application to all instances of a structural description. But the issue is really one of position-specificity, with derivational order being one way of identifying the positions to which a rule applies.

2.1 Pima

Pima (Uto-Aztecan) marks plurals by reduplication at the left edge of the stem. As illustrated in (3) below, the reduplicant is either a single consonant (3a) or a consonant-vowel sequence (3b). According to the analysis of Riggle 2003, the reduplicant (marked in bold) is an infix, and surfaces as a single consonant except when phonotactic constraints force a vowel to be copied as well.

(3) Plural reduplication in Pima (exx from Munro & Riggle 2004)

a.	mavit (sg)	ma**m**vit (pl)	'lion'
	kosvuɻ (sg)	ko**k**svuɻ (pl)	'cocoon'
b.	ʔiput (sg)	ʔi**ʔi**put (pl)	'dress'
	mondʒuɻ (sg)	mo**mo**ndʒuɻ (pl)	'cape'

Although reduplication to mark the plural is fully obligatory for words that contain a single stem, as in (3), plurals of forms that contain more than one stem, such as the compound *ʔus-kàlit-váinom* 'wagon-knife' (lit. 'tree-car-knife'), exhibit an uncommon degree of optionality. The descriptive generalization for such multi-stem forms is that any of the stems can be reduplicated, with the restriction that at least one of them must be. The plural variants for *ʔus-kàlit-váinom* appear in (4).

(4) Local optionality in Pima: plural variants for *ʔus-kàlit-váinom* 'wagon-knife'
ʔu**ʔu**s-kà**k**lit-vá**pa**inom, ʔu**ʔu**s-kà**k**lit-váinom, ʔu**ʔu**s-kàlit-vá**pa**inom[3],
ʔus-kà**ka**lit-vá**p**ainom, ʔu**ʔu**s-kàlit-váinom, ʔus-kà**k**lit-váinom,
ʔus-kàlit-vá**p**ainom (exx from Munro & Riggle 2004)

This pattern of optionality is completely productive for Pima compounds, occurring even with Spanish borrowings that have compound-like prosody. The various degrees of reduplication do not correlate with degrees of semantic and/or pragmatic plurality, and are independent of the morphological bracketing of the compound.

Following Riggle 2003, we take BR-MAX-[C ('a stem-initial consonant in the base must have a correspondent in the reduplicant') to be the constraint that drives left-edge copying in Pima. Reduplication is optional under certain circumstances because BR-MAX-[C is tied with a constraint that is violated by structure in the output; we take this to be simply *STRUC (e.g., Zoll 2003).[4] Dominating these two tied constraints is REALIZEMORPH(pl), which requires the plural morpheme to have some phonological exponent in the output.[5] It is REALIZEMORPH(pl) that consistently forces reduplication in examples such as (3), and that mandates reduplication of at least one stem in examples such as (4).

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[3] This example and others show a *v* ~ *p* mutation found in several Uto-Aztecan languages.
[4] An alternative approach to RED minimization would use OO-DEP (Gouskova 2004a, to appear).
[5] See Samek-Lodovici 1996, Kurisu 2001, and others for formalization of such constraints.

Simply allowing BR-MAX-[C and *STRUC to be variably ranked is not sufficient to account for the full range of variation observed in (4). The ranking {BR-MAX-[C >> *STRUC} requires reduplication of all stems, as in *ʔu**ʔu**s-kà**k**lit-vá**pa**inom*. The alternative ranking {*STRUC >> BR-MAX-C]} requires reduplication to be minimal — just enough to satisfy dominant REALIZEMORPH(pl) — and could perhaps account for the three variants *ʔu**ʔu**s-kàlit-váinom*, *ʔus-kà**k**lit-váinom*, and *ʔus-kàlit-vá**p**ainom*.[6] But intermediate outputs, in which only two stems are reduplicated, are not generated under any ranking. This is collective harmonic bounding: outputs such as *ʔu**ʔu**s-kà**k**lit-váinom*, *ʔu**ʔu**s-kàlit-vá**pa**inom*, and *ʔus-kà**k**lit-vá**p**ainom* are incorrectly predicted to be ungrammatical because, under each possible resolution of the tie {BR-MAX-[C ≈ *STRUC}, there is some better candidate — one that copies more or less base material.

(5) Collective harmonic bounding in Pima

/RED - ʔus-kàlit-váinom/	REALIZEMORPH(pl)	BR-MAX-[C	*STRUC
a. ʔu**ʔu**s-kà**k**lit-vá**pa**inom			* * * * *
b. ʔu**ʔu**s-kà**k**lit-váinom		*	* * *
b.′ ʔu**ʔu**s-kàlit-vá**pa**inom		*	* * * *
b.″ ʔus-kà**k**lit-vá**pa**inom		*	* * *
c. ʔu**ʔu**s-kàlit-váinom		* *	* *
d. ʔus-kàlit-váinom	* !		

As we show formally in section 3, position-specific evaluation (2) eliminates the harmonic bounding of candidates (b-b″) by effectively allowing BR-MAX-[C and *STRUC to be ranked independently for each stem. An alternative analysis, which we consider here, is that optionally arises from cyclic application of reduplication. Two facts weigh against this alternative. First, as noted above, at least one stem in a complex form must undergo reduplication. This shows that application of reduplication to each stem is not independent in the way a cyclic derivation would suggest, and requires either some degree of look-ahead or an output filter that applies only at the level of the entire compound (i.e., not to its constituent stems). Second, certain free-standing stems have suppletive plurals forms, such as *múuki* (sg) ~ *koʔi* (pl) 'corps' and *jí́viadam* (sg) ~ *dó́dakam* (pl) 'arriver', but these forms do not occur in compounds, which undergo regular plural reduplication: *múuki-jí́viadam* (sg) ~ *múu**m**ki-jí**j**viadam* (pl) 'dragonfly' (lit. corps-arriver). A cyclic analysis would again require some look-ahead, or access to the surrounding morphosyntactic structure, to ensure that irregular plurals such as *koʔi* and *dó́dakam* do not occur within compounds. In the fully parallel analysis of pluralization that we propose, the fact that reduplication of one stem can affect the realization of another — and more generally that plural formation can depend on global properties of the structure — poses no particular difficulty.

[6] We say 'perhaps' because other, lower-ranked constraints could potentially decide among these.

2.2 French

French schwa deletion stands as a crucial test case for theories of optionality in generative phonology (Anderson 1974, Howard 1973, Dell 1980). Examples such as (6a), already cited in the introduction, and (6b) provide support for our proposal. Throughout this subsection, we adopt the approximation that schwa deletion is blocked from creating a triconsonantal cluster. Although the facts are interestingly more complicated (Dell 1980:225ff.), this simplification will streamline our presentation without affecting the points that we make.

(6) Local optionality in French
  a. *(tu as) envie de te battre* '(you) feel like fighting'
   ãvidtəbatʁ, ãvid**ə**tbatʁ, ãvid**ə**təbatʁ
  b. *envie de te le demander* 'feel like asking you'
   ãvidtəld**ə**mãde, ãvidtəl**ə**dmãde, ãvid**ə**tl**ə**dmãde, ãvidtəl**ə**d**ə**mãde,
   ãvid**ə**tl**ə**d**ə**mãde, ãvid**ə**təld**ə**mãde, ãvid**ə**təl**ə**dmãde, ãvid**ə**təl**ə**d**ə**mãde

The problem raised by examples such as (6b) is analogous to the one encountered above in Pima. Given a Markedness constraint against schwas (provisionally, *SCHWA) and a Faithfulness constraint that is violated by schwa deletion (MAX-V), it is clear how the variable ranking {*SCHWA ≈ MAX-V} can yield on the one hand outputs with maximal deletion, such as *ãvidtəld**ə**mãde*, *ãvidtəl**ə**dmãde*, and *ãvid**ə**tl**ə**dmãde*, and on the other hand outputs with no deletion, such as *ãvid**ə**təl**ə**d**ə**mãde*. But no ranking of these constraints would generate outputs such as *ãvidtəl**ə**d**ə**mãde*, *ãvid**ə**tl**ə**d**ə**mãde*, *ãvid**ə**təld**ə**mãde*, and *ãvid**ə**təl**ə**dmãde*, which have undergone neither the maximal nor the minimal amount of deletion. These 'intermediate' outputs are collectively harmonically bounded with respect to this constraint set, and moreover with respect to all plausible extensions of this constraint set that we have considered.

Examples such as (6a) pose a different, but equally serious, problem. The output constraint on triconsonantal clusters prevents both schwas from deleting (**ãvidtbatʁ*). The crucial question is how deletion of either one can be equally good. In order for deletion to occur at all, the tie must be resolved as {*SCHWA >> MAX-V}. But the optionality between *ãvidtəbatʁ* and *ãvid**ə**tbatʁ* requires in addition that (i) these two outputs are indistinguishable with respect to all other constraints or (ii) there are additional tied constraints that, when ranked in all possible ways, yield the observed variation. Possibility (i) is immediately excluded by the fact that deletion of different schwas will, in this case and in general, give rise to crucially different consonant clusters. Possibility (ii), although difficult to disprove conclusively, is highly implausible. To give just one example of the kind of considerations that arise, note that according to certain theories of syllable contact (e.g., Gouskova 2004b), the medial cluster in *ãvidtəbatʁ* has falling sonority whereas the medial cluster in *ãvid**ə**tbatʁ* has rising sonority. Syllable contact constraints would therefore prefer the former over the latter; it is difficult to see what other constraint or constraints could, by virtue of being tied with syllable contact, express a countervailing preference.

The solution that we propose for both types of example in (6) is in important respects identical to the one that we offered for Pima. Forms such as *ãvidtələdəmãde* and *ãvidətbatʁ* are not harmonically bounded, because there are rankings under which *SCHWA dominates MAX-V at all and only the positions where deletion is observed.

2.3 Miya

The final case that we discuss is that of palatalization in Miya, as described and analyzed in Schuh 1998, 2002. Although this case is somewhat complex, and we can only touch on it here, it is notable for providing examples of local optionality that are clearly morpheme-internal. According to Schuh's analysis, palatalization is a word-level prosodic feature. This feature has several phonological effects, changing alveolar fricatives and affricates to alveopalatals, adding secondary palatalization to other consonants, and raising the three phonemic vowels /ə a aː/ to [i ɛ æː]. As in other cases in which hidden structure is posited, the feature [PAL(ATALIZED)] accounts for why these effects are systematically correlated rather than being randomly distributed across the lexicon. Some minimal pairs that show the [PAL]/non-[PAL] contrast are in (7).

(7) Palatalization in Miya (exx from Schuh 1998, 2002)
  a. Palatalized
    l**ɛ́**b**ɛ**d**i** 'basket' (m), m**ì**r 'money' (f), **á**t**í**m 'nose' (f)
  b. Non-palatalized
    làbadə 'shoulder' (m), mə̀r 'sesame' (f), átə́m 'song' (f)

As illustrated by (7a) and other examples that Schuh discuss, the effects of [PAL], except for palatalization of alveolar fricatives and affricates, are optional: 'In a word marked as [PALATALIZED], obligatorily change [+coronal, +strident, -lateral] segments to [-anterior]; optionally in such words and obligatorily in any other word, palatalize one or more consonants and/or front one or more vowels' (Schuh 1998:34). The examples in (8a) illustrate variable realizations of the same lexical items, whereas those in (7a) and (8b) show variation in the realization of [PAL] across words.

(8) Local optionality in Miya (exx from Schuh 1998, 2000)
  a. **kʲ**ánúw ~ k**ɛ́**núw 'smoke', áp**ɛ**tlám ~ **á**p**ʲ**atlám 'hip',
    r**ɛ̀**ɗ**ʲ**aɗ**i** ~ rà**ɗʲ**aɗ**i** 'dampness, cold'
  b. d**idʲ**ad**i** 'falling', ʔ**ídʒ**ə 'mortar'

We do not know of any constraint-based treatments of optionality, other than position-specific evaluation, that could provide an account for the fact that the second *d* in ***didʲadi*** palatalizes and the other two do not, or that the first vowel in ***ʔídʒə*** raises and the other does not. (Examples such as *ág*^{j}*ír* ‘hole’ show that there is no general ban on adjacent realizations of [PAL]).

3. Position-specific evaluation

As argued in section 2, previous reranking approaches to optionality in OT fail to predict the full range of attested optional variants. The problem lies, we argue, in the level or granularity at which reranking applies in those approaches. They allow reranking to happen inter-derivationally, so that different input/output mappings can be subject to different rankings. We propose that, in order to account for variants that are harmonically bounded in previous theories, reranking must also be allowed intra-derivationally. Variable rankings of the form {C≈D} can be resolved differently at different positions in the same input/output mapping.

3.1 Intra-derivational reranking

Our proposal works basically as follows. In the derivation of an output for a given input, each constraint C is instantiated as multiple position-versions (C@*i*), at least one for each input segment. Local optionality is then derived by allowing the ranking of tied constraints to be determined on a position-by-position basis, as schematized in (9).

(9) Inter-derivational reranking (illustrated for two positions)
- a. C dominates D at both positions
  C@1 >> D@1, C@2 >> D@2
- b. C dominates D at position 1 but not at position 2
  C@1 >> D@1, D@2 >> C@2
- c. C dominates D at position 2, but not at position 1
  D@1 >> C@1, C@2 >> D@2
- d. C is dominated by D at both positions
  D@1 >> C@1, D@2 >> C@2

We use the indices of Correspondence Theory (‘CT’; McCarthy & Prince 1995) to distinguish the position-specific versions of a constraint. Some reference to the input is required because, as Eisner 2000 points out in a different context, the input is the single common thread that relates all of the candidates to one another.[7] By using CT indices for this purpose, we connect our proposal to McCarthy’s (2003a) recent work on comparative markedness.

To implement this proposal, each constraint violation must be assessed to a specific location (not to the candidate as a whole). For most faithfulness constraints, the locus of violation follows straightforwardly from the CT index of the segment. For example, deletion of the first segment in the input will violate MAX@1. Likewise, for simple markedness constraints the locus of violation is taken to be the CT index of the

[7] Eisner (2000) indexes constraints to implement his proposed *directional evaluation*, according to which satisfaction of constraints closer to one edge of a form is more important than satisfaction of successive constraints leading away from that edge.

output segment, if it has one. For example, if the output correspondent of the third segment in the input is a voiced obstruent, then a violation of *VOICEDOBSTR@3 is assessed. For markedness constraints that refer to more than one segment, it is necessary to designate one of the segments (or possibly both) as the locus of violation. Although we do not know at this point how such designations should be determined in all cases, we note that the issue raised here — that of determining the *locus of violation* of a constraint — is the subject of other recent research (Lubowicz 2005, McCarthy 2003ab).

The indexation of violations for epenthetic segments raises special issues. Although there are several conceivable approaches, we have been unable to distinguish among them, because we lack strong data on how optional processes interact with epenthesis. We provisionally propose that epenthetic segments are indexed with a pair of CT indices, one for each of the non-epenthetic segments on either side of them (with 0 and n+1 for epenthesis at edges, where n is the number of input segments). Given this proposal, the set of position-specific constraints must be further expanded to include constraints indexed with each pair of CT indices that occur in the input. We emphasize that there are many alternatives to this proposal, which is adopted only in order to make the necessary bookkeeping more explicit.

3.2 Local optionality in Pima

Local optionality in Pima plural reduplication can be derived with intra-derivational reranking if B/R-MAX-[C and *STRUC are instantiated over positions and freely interspersed. Because segments in the reduplicant are in some sense epenthetic, but still connected to the input/output CT relation via their base correspondents, we assign them special indices prefixed with ‘R’. A reduplicative segment whose base correspondent has the input/output CT index i is therefore indexed by Ri. (We do not discuss reduplication of epenthetic segments here, but assume that the proposal in 3.1 would carry over to such cases).

The tableau in (10) below shows how one of the previously harmonically-bounded plural forms for *ʔus-kàlit-váinom*, namely *ʔu**ʔu**s-kà**k**lit-váinom*, is derived from a particular ranking of position-specific constraints. (For space reasons, we suppress the dominant constraint REALIZEMORPH(pl) entirely, and only show the position-specific versions of the other constraints that are directly relevant to the analysis. The reader should keep in mind, however, that there is one version of each constraint for each input index, and one for each reduplicative ‘R’ index as well.)

Constraints that are not variably ranked with respect to one another can be thought of as a single column in a tableau. For instance, the default pattern of reduplication in Pima consists of copying just the initial C of the stem, but if the initial C is a laryngeal then a phonotactic constraint against laryngeal codas results in the initial CV sequence being copied instead. Although the economy constraint *STRUC is variably ranked with B/R-MAX-[C, it is dominated by the constraint against laryngeal codas (*LARCOD). Thus, at any position where B/R-MAX-[C dominates *STRUC, if that position contains a laryngeal, then an additional *STRUC violation will be incurred because the following vowel will be forced to reduplicate as well. An example of this type of interaction is seen in the first instance of reduplication in $ʔ_{1}$*u*$\boldsymbol{ʔ}_{R1}$***us**-k*$_{2}$*à***k**$_{R2}$*lit-v*$_{3}$*áinom*.

(10) Analysis of local optionality in Pima

/RED - ʔ$_1$us-k$_2$àlit-v$_3$áinom/	BR-Max-[C @1	*Struc @R1	BR-Max-[C @2	*Struc @R2	*Struc @R3	BR-Max-[C @3
a. ʔ$_1$u**ʔ**$_{R1}$**u**s-k$_2$à**k**$_{R2}$lit-v$_3$á**p**$_{R3}$**a**inom		*		*	* !	
b. ʔ$_1$u**ʔ**$_{R1}$**u**s-k$_2$à**k**$_{R2}$lit-v$_3$áinom		*		*		*
b.′ ʔ$_1$u**ʔ**$_{R1}$**u**s-k$_2$àlit-v$_3$á**p**$_{R3}$**a**inom		*	* !		*	
b.″ ʔ$_1$us-k$_2$à**k**$_{R2}$lit-v$_3$á**p**$_{R3}$**a**inom	* !			*	*	
c. ʔ$_1$u**ʔ**$_{R1}$**u**s-k$_2$àlit-v$_3$áinom		*	* !			*
d. ʔus-kàlit-váinom	* !		*			*

3.3 Against mark omission

Indexation of constraint violations as in tableau (10) is designed to ensure that violations at the same position have the same harmony across candidates. At first blush one might imagine a closer analog to optional rule application, according to which optionality was implemented by optionally removing marks from certain candidates. We refer to this proposal as mark omission.

Though apparently simple, mark omission runs afoul of two problems. At the most basic level, it is hard to see exactly what the candidate set should be under this proposal. If *Gen* produces all candidates with all patterns of marks both present and omitted, then optimization will always select the candidates with the marks omitted — effectively rendering the optional constraint inert. The proposal also runs against the central tenet of OT that constraints are never 'turned off'. Mark omission could, in extreme cases, lead to massive gratuitous violations of the optional constraint. Our proposal avoids this problem because, rather than being switched off in certain positions, position-specific constraints are merely demoted. The general principle of OT, according to which constraints are violated only when compelled by higher-ranked constraints, is therefore maintained under position-specific evaluation.

3.4 Against mark pooling

Another intuitively appealing strategy for generating local optionality is the collapsing of tied constraints so that they yield a single shared pool of violations. This might seem plausible as an analysis of the French data from section 2.2, as shown in tableau (14). If the violations in this tableau are collapsed into a single column, each candidate gets two marks — apparently resulting in a three-way tie for optimality.

(11) Mark pooling in French

/ ãvidətəbatʁ/	*SCHWA	MAX-V
a. ãvidətəbatʁ	* *	
b. ãvidətbatʁ	*	*
b.′ ãvidtəbatʁ	*	*

There are two general problems with this approach to optionality. First, as noted in section 2.1, ties are unstable. If any constraint lower in the hierarchy has a preference among the candidates in (11), then the tie is broken and at least one of the observed outputs will fail to be predicted. Continuing this line of argument one step further, we see that mark pooling runs counter to the principle that all constraints are universal. If the former is adopted as the approach to optionality, the latter seems untenable, because any universal constraint set would surely contain many constraints that could in principle emerge to break ties such as the one in (11).

Second, the Pima data shows that antagonistic variably ranked constraints do not always assess the same number of marks. Whenever the phonotactics require that a CV sequence is copied, the trade-off is not between a single BR-MAX-[C violation and a single *STRUC violation, but between a single BR-MAX-[C violation and two *STRUC violations. Application of the mark pooling approach to Pima would incorrectly predict that reduplication is optional only when it involves copying a single segment.

Position-specific evaluation avoids both of these problems by cleanly separating positional interaction from mark counting. We have already seen this for Pima in tableau (10). One relevant tableau for French is given in (12), where syllable contact (SYLLCON) plays the role of a lower-ranked constraint that could in principle eliminate *ãvidətbatʁ*.

(12) Local evaluation in French

/ ãvid$ə_1$t$ə_2$batʁ/	*SCHW@2	MAX-V@2	MAX-V@1	*SCHW@1	SYLLCON
b. ãvid$ə_1$tbatʁ		*		*	*
b.′ ãvidt$ə_2$batʁ	* !		* !		

4. Conclusion

In this paper, we have argued that the existence of cases of local optionality forces a revision in the reranking approach to optionality. Instead of applying across derivations, and to constraints that evaluate the entire output, reranking applies within derivations, to constraints that are specialized for position. The development of this position focused mainly on how it eliminates improper harmonic bounding relations, but also touched on issues of cyclic vs. parallel optimization, the technical problem of distinguishing loci of violation, and the universality of constraints. To conclude, we discuss the implications of *global* optionality for our proposal.

We are aware of two relevant cases. The first is labial (de)voicing in Warao (Osborn 1966ab, 1997), as in examples such as *barobarera* ~ *paroparera* ‘weak’.

According to Osborn's description, this process applies either to all of the labial stops in a word, or to none of them. The second case comes from Bole (Schuh 2002). In this languages, sibilants are optionally realized as [+anterior] or [–anterior], as in *sansala* ~ *ʃanʃala* 'pumpkin' and *sàːsu* ~ *ʃàːʃu* 'do again'; forms with mixed anteriority are banned by a phonotactic that is surface-true in the language (**ʃansala*, **sanʃala*). These two cases appear quite different from the perspective of position-specific evaluation. Bole is a completely expected case in which a harmony constraint that applies to all sibilants in a word forces [anterior] variation to be global. In contrast, Warao is a completely unexpected case in which segments at different positions are forced to behave similarly in the absence of a constraint that directly relates them. As has been noted many times in the literature (Anderson 1974, Howard 1973), the existence of true global optionality in Warao, and elsewhere, is only weakly supported by the facts (we find exactly two convincing forms in Osborn's data). We therefore maintain that our proposal is a viable one, but also look forward to a more conclusive resolution of this vexing issue.

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Jason Riggle
Department of Linguistics
University of Chicago
1010 E. 59th St.
Chicago, IL 60637

jriggle@uchicago.edu

Colin Wilson
Department of Linguistics
UCLA
3125 Campbell Hall
Los Angeles, CA 90095

colin@humnet.ucla.edu